



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

AMENDMENTS  
TO  
THE WATER QUALITY CONTROL PLAN FOR THE  
SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS  
FOR  
THE CONTROL OF DIAZINON AND CHLORPYRIFOS RUNOFF  
INTO THE LOWER SAN JOAQUIN RIVER

APPENDIX C-1, C-2 & C-3  
DIAZINON AND CHLORPYRIFOS CONCENTRATION DATA

PUBLIC REVIEW DRAFT STAFF REPORT



*August 2005*

*State of California*  
*California Environmental Protection Agency*  
**REGIONAL WATER QUALITY CONTROL BOARD**  
**CENTRAL VALLEY REGION**

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**DISCLAIMER**

*This publication is a report by staff of the  
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The Regional Board will be considering the proposed policies and regulations  
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Board*

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## **Appendix C1**

### **Monthly Diazinon and Chlorpyrifos Concentration Box Plots for San Joaquin River and Tributary Monitoring Stations**

*Explanation of the box plot:* The rectangular part (box) of the plot extends from the lower quartile (25<sup>th</sup> percentile) to the upper quartile (75<sup>th</sup> percentile), covering approximately the center half of the data for each month. The horizontal lines within each box show the value of the median sample concentration for each month. The whiskers extend from the box to the minimum and maximum concentration values in each month, unless there are any values ‘outside’ 1.5 times the interquartile range (the range between the 25<sup>th</sup> and 75<sup>th</sup> percentile values, i.e., the interquartile range [IQR]). ‘Outside’ concentration values are plotted above or below the box as asterisks. If there are concentration values beyond (above) 1.5 times the IQR, the whisker ends at the value equal to 1.5 times the IQR. Any concentration values that would plot beyond (above) the range of the graphs are shown in brackets above the graphs, and above their appropriate months. In addition, upper quartile, median or maximum concentration values (that are not considered ‘outside’ values) that would plot above the graphs are similarly shown in brackets and indicated as either “max=”, “med=” or “Q<sub>3</sub>=”, respectively.

The proposed acute diazinon water quality target value of {0.10 µg/L} and the acute chlorpyrifos water quality objective {0.025 µg/L} values are plotted as horizontal lines on the appropriate respective graphs. The data used for calculation and construction of the box plots includes “0” values for concentrations below the laboratory detection limits. These “0” values tend to skew the box plot median values to lower values.

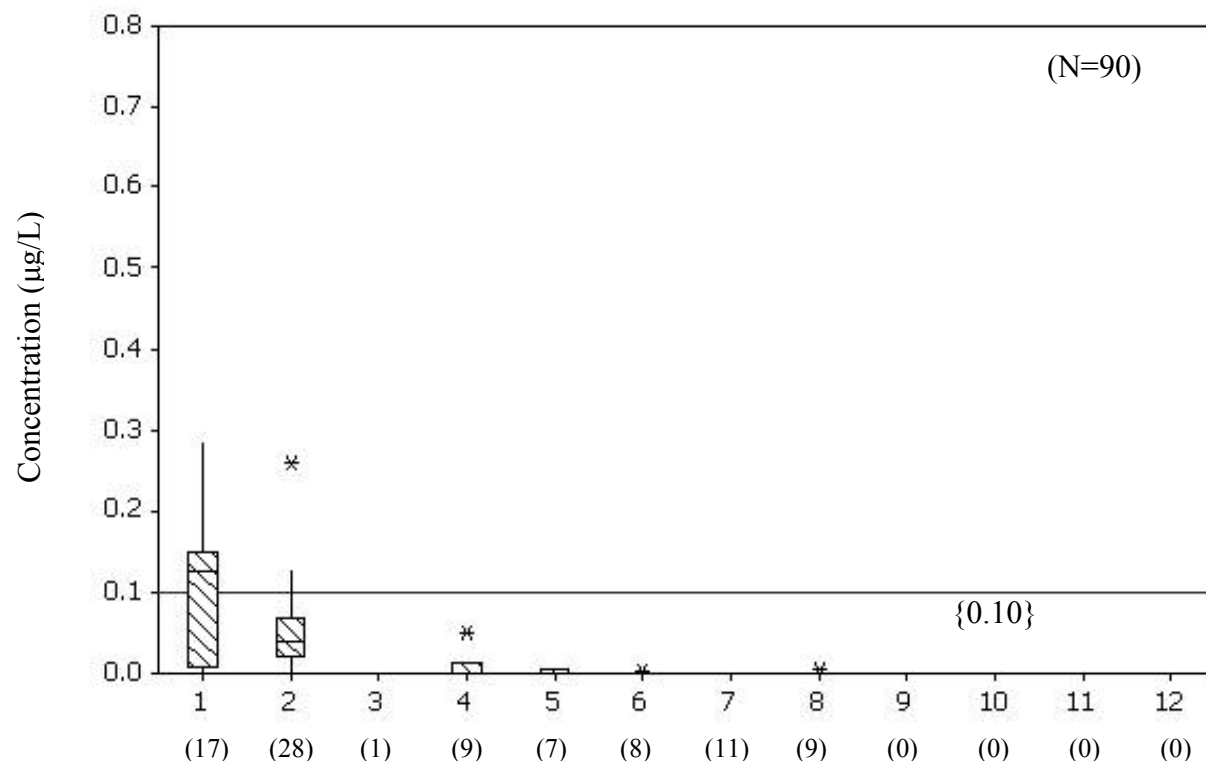
The numbers (1 through 12) beneath each graph correspond to the months (e.g., 1 = January, 2 = February, etc.). The numbers in parentheses beneath the month numbers are the number of samples (n) analyzed during the associated month for the time period indicated in the graph’s caption. The number (N) in the upper right corner of each graph is the total number of samples analyzed for the associated location during the time period indicated in the graph’s caption.

The box plots are presented for the San Joaquin River mainstem monitoring stations first, then for the stations along major tributaries to the San Joaquin River. The mainstem stations (and subsequent tributary stations) are presented from upstream to downstream order along the San Joaquin River. A brief description of the data (data sources, years in which the data was collected) used for the box plots precedes each set (monitoring station) of box plots.

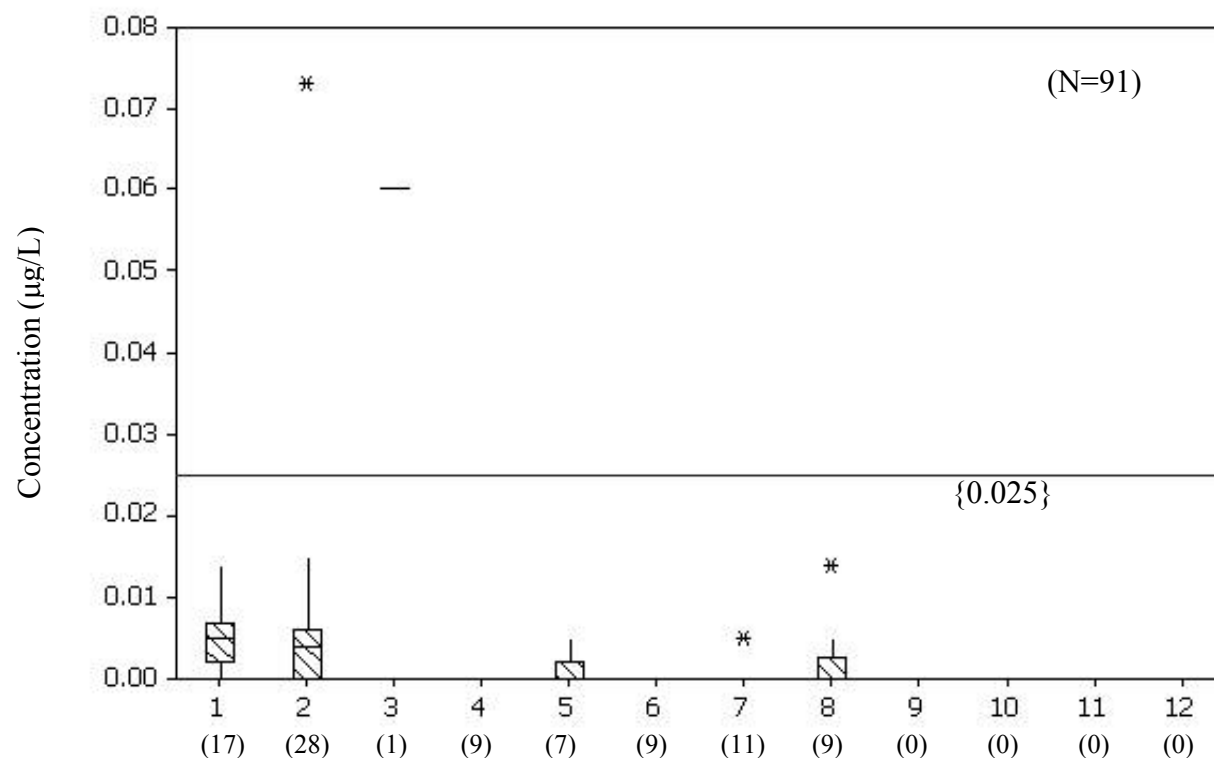
**San Joaquin River at Lander Avenue (Highway 165) near Stevinson monthly diazinon and chlorpyrifos concentration data, 1991 – 2003**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the periods between 1991 and 1994 (11 data values), between 2000 and 2001 (63 data values), and in 2003 (16 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (11 data values), between 2000 and 2001 (63 data values), and in 2003 (17 data values).



San Joaquin River at Lander Avenue (Hwy 165) near Stevenson monthly diazinon concentrations



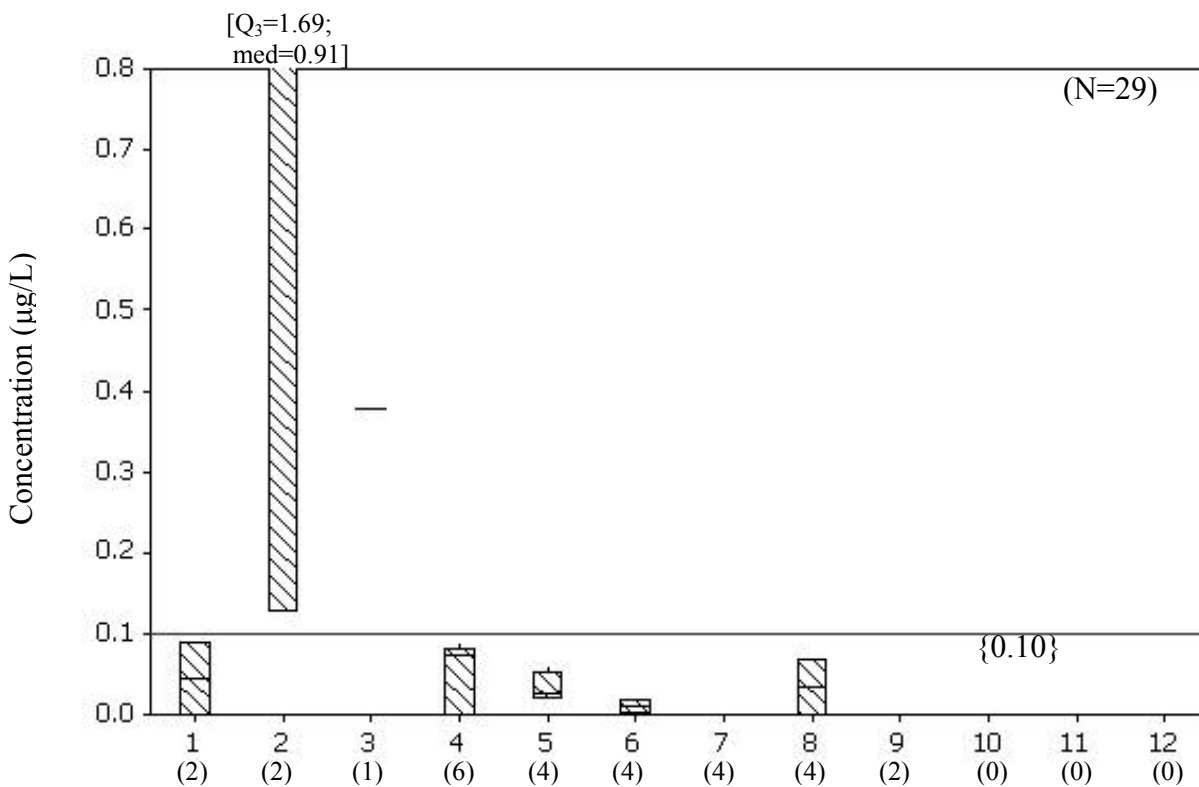
San Joaquin River at Lander Avenue (Hwy 165) near Stevenson monthly chlorpyrifos concentrations

**San Joaquin River at Hills Ferry Road near Newman monthly diazinon and chlorpyrifos concentration data, 1991 – 1993**

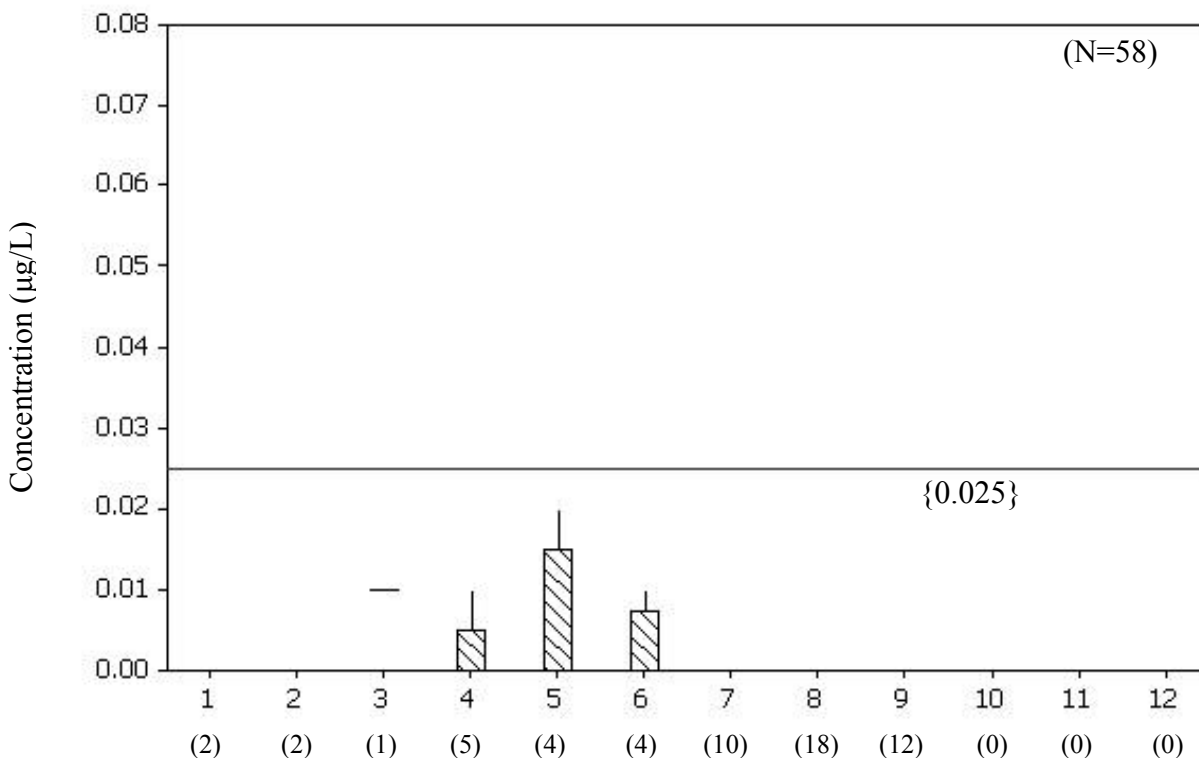
Concentration data for this monitoring site was obtained from the following source:  
DPR Surface Water Database.

The diazinon data was collected in the period between 1991 and 1993 (29 data values). The chlorpyrifos data was collected in the period between 1991 and 1993 (58 data values).





San Joaquin River at Hills Ferry Road near Newman monthly diazinon concentrations

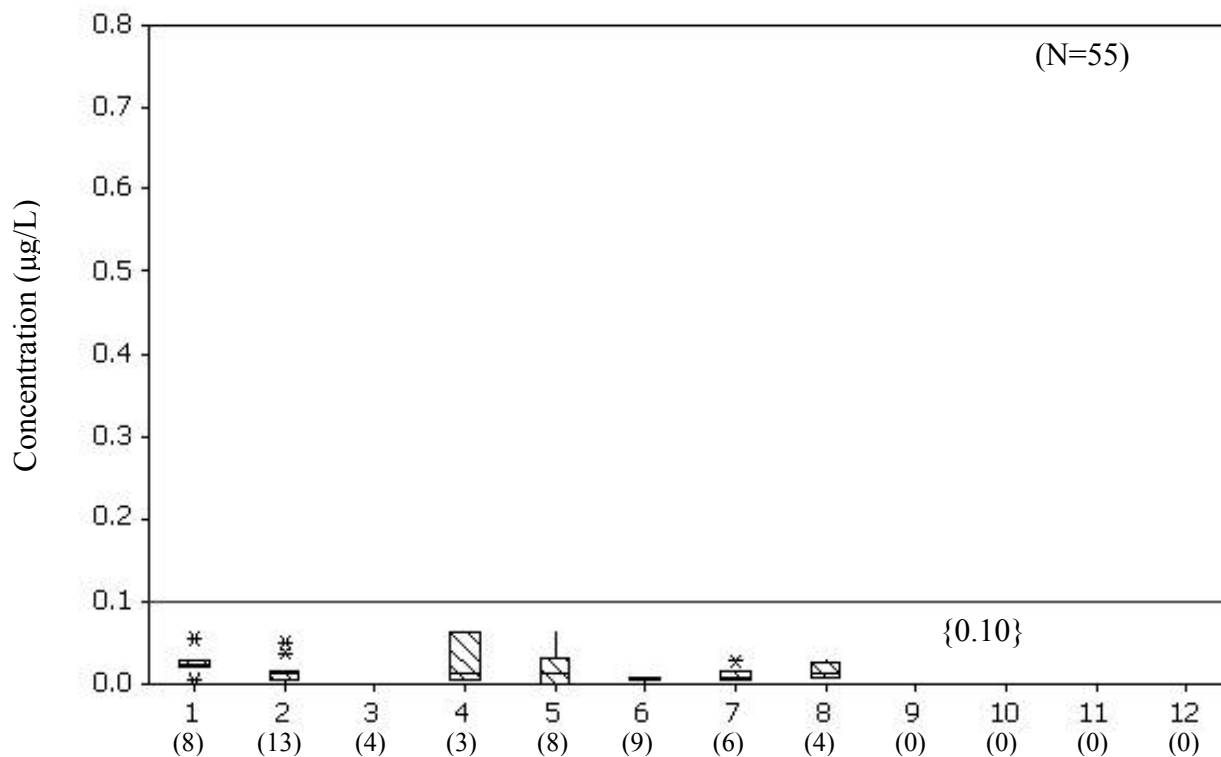


San Joaquin River at Hills Ferry Road near Newman monthly chlorpyrifos concentrations

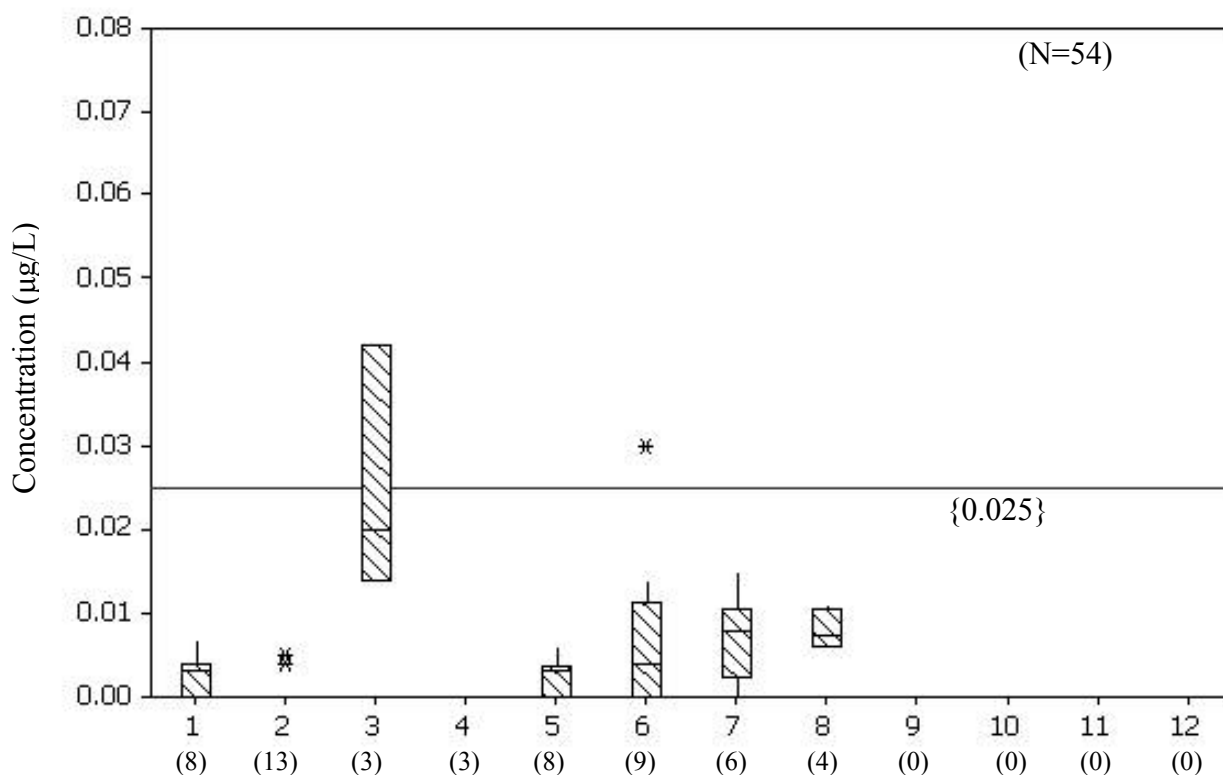
**San Joaquin River at Las Palmas Avenue near Patterson monthly diazinon and chlorpyrifos concentration data, 1994 – 2002**

Concentration data for this monitoring site was obtained from the following sources: USGS and CVRWQCB.

The diazinon data was collected in 1994 (5 data values) and in the period between 2000 and 2002 (50 data values). The chlorpyrifos data was collected in 1994 (5 data values) and in the period between 2000 and 2002 (49 data values).



San Joaquin River at Las Palmas Avenue near Patterson monthly diazinon concentrations

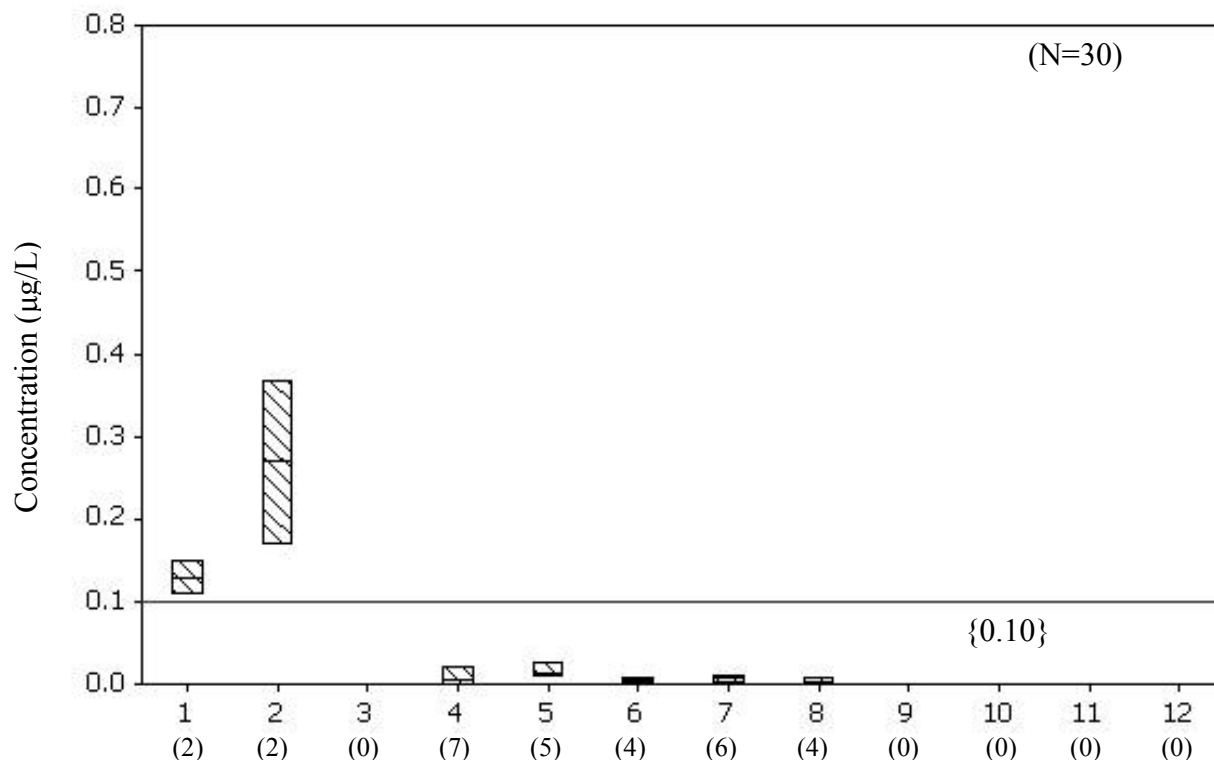


San Joaquin River at Las Palmas Avenue near Patterson monthly chlorpyrifos concentrations

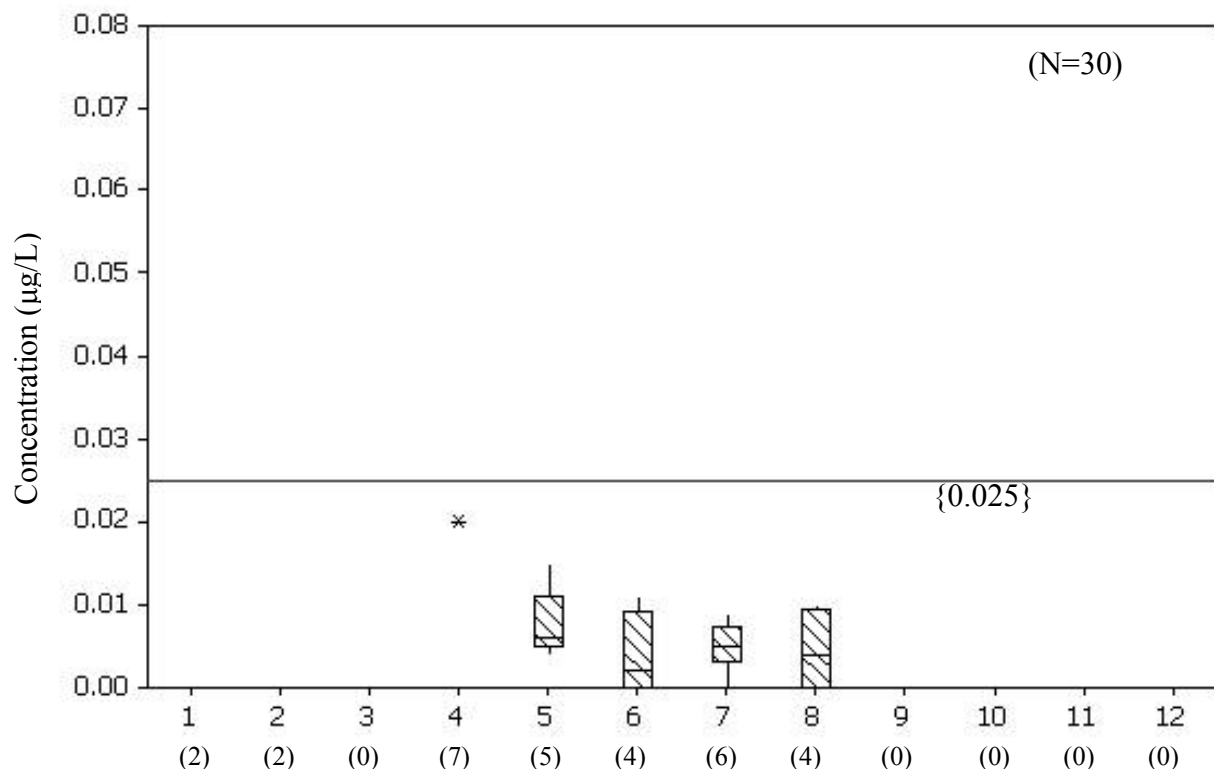
**San Joaquin River at Maze Boulevard monthly diazinon and chlorpyrifos concentration data, 1991 – 2001**

Concentration data for this monitoring site was obtained from the following sources:  
DPR Surface Water Database and USGS.

The diazinon data was collected in the period between 1991 and 1993 (10 data values) and in 2001 (20 data values). The chlorpyrifos data was collected in the period between 1991 and 1993 (10 data values) and in 2001 (20 data values).



San Joaquin River at Maze Boulevard monthly diazinon concentrations

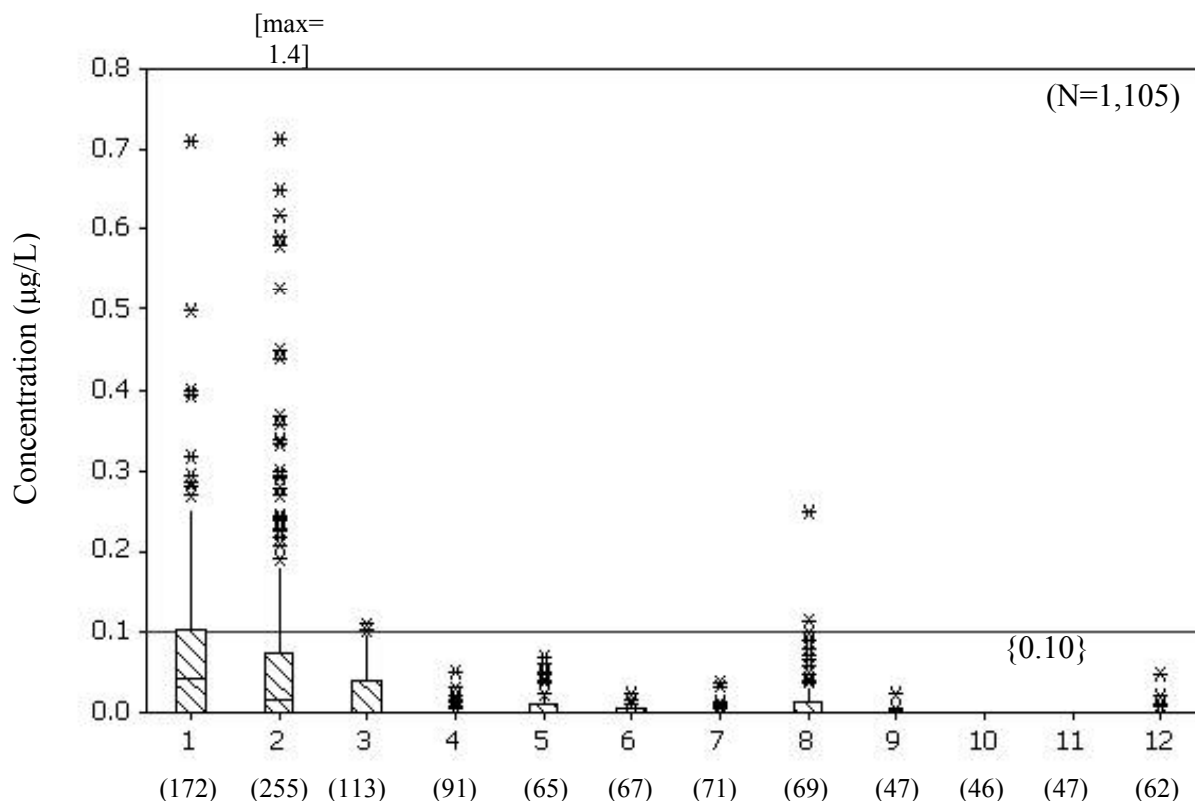


San Joaquin River at Maze Boulevard monthly chlorpyrifos concentrations

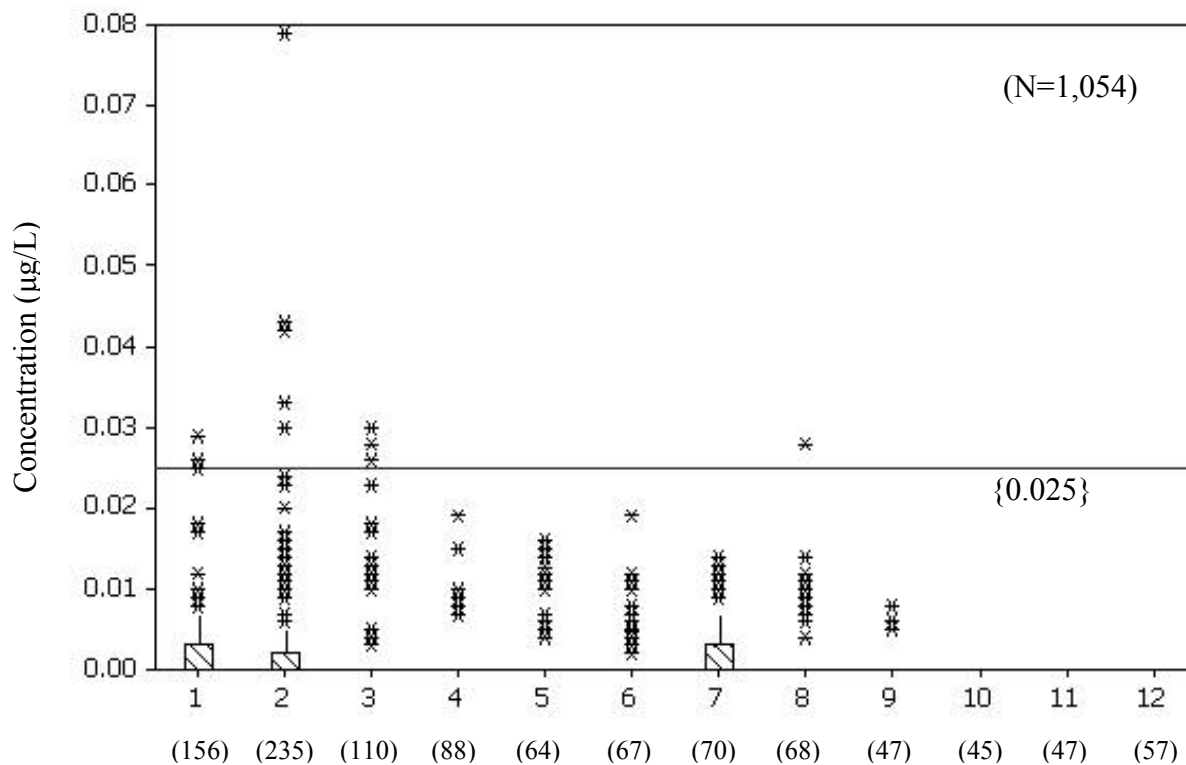
**San Joaquin River at Airport Road near Vernalis monthly diazinon and chlorpyrifos concentration data, 1991 – 2004**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the period between 1991 and 2004 (1,097 data values). The chlorpyrifos data was collected in the period between 1991 and 2004 (1,054 data values)



San Joaquin River at Airport Road near Vernalis monthly diazinon concentrations



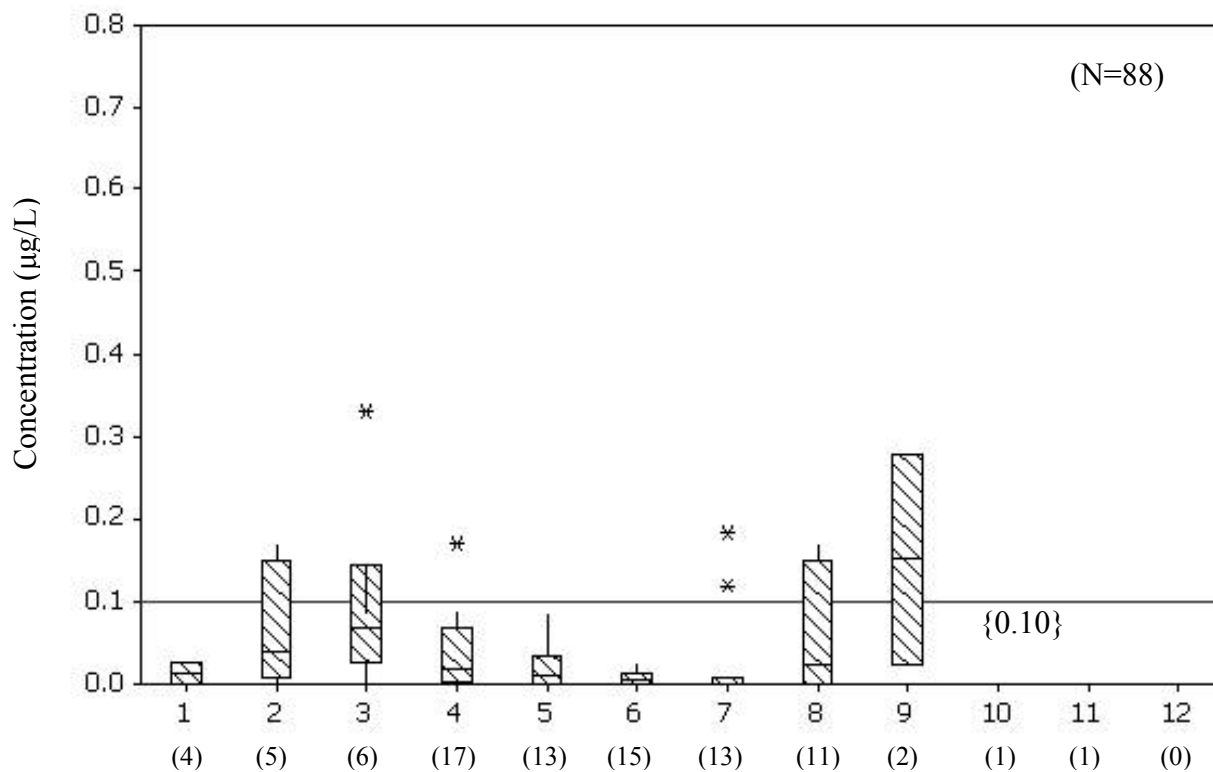
San Joaquin River at Airport Road near Vernalis monthly chlorpyrifos concentrations

**Salt Slough at Lander Avenue (Highway 165) monthly diazinon and chlorpyrifos concentration data, 1991 – 2003**

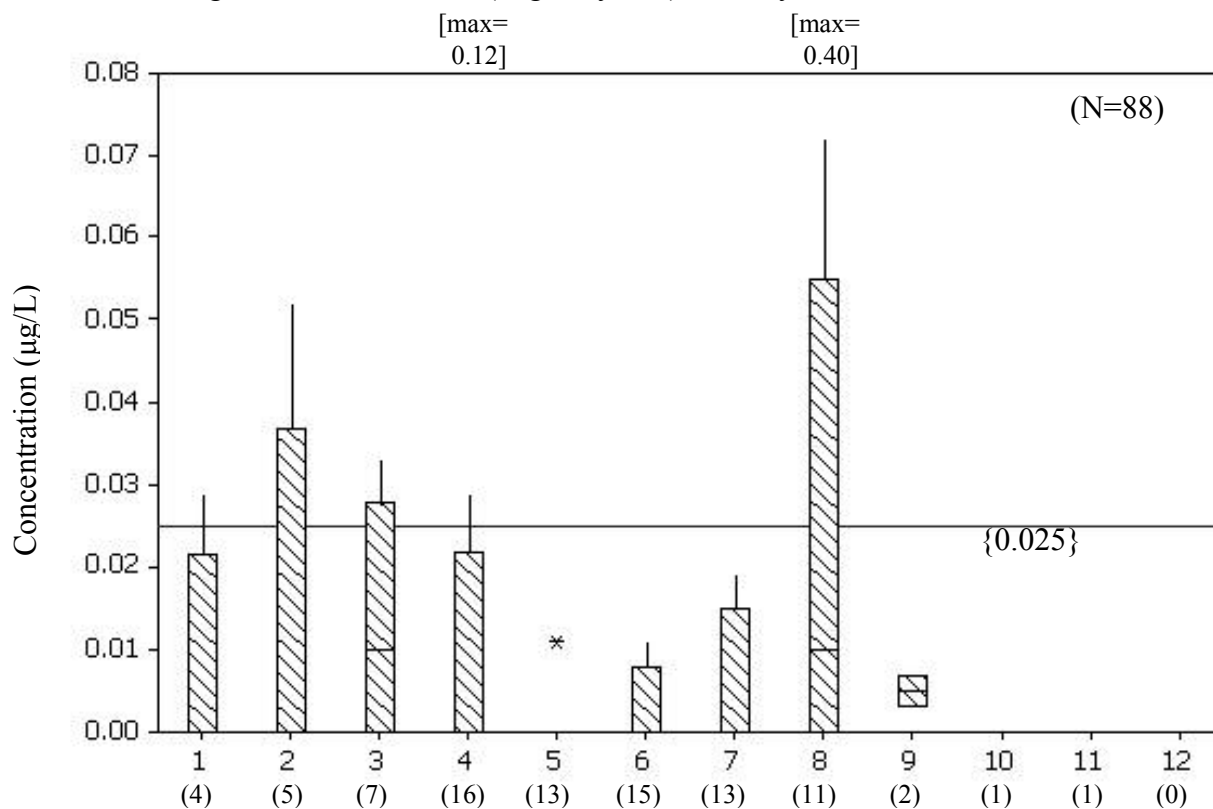
Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the period between 1991 and 1994 (49 data values), in 2001 (22 data values), and in 2003 (17 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (46 data values) and between 2001 and 2003 (41 data values)





Salt Slough at Lander Avenue (Highway 165) monthly diazinon concentrations

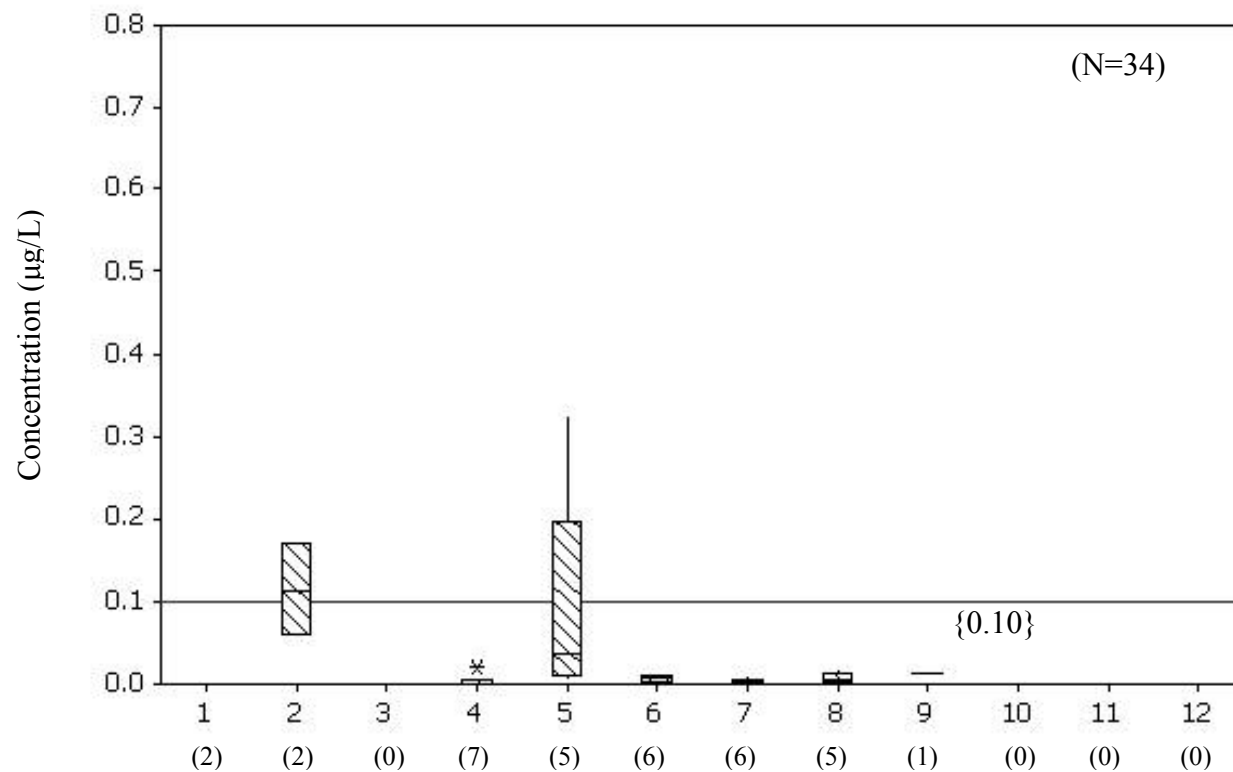


Salt Slough at Lander Avenue (Highway 165) monthly chlorpyrifos concentrations

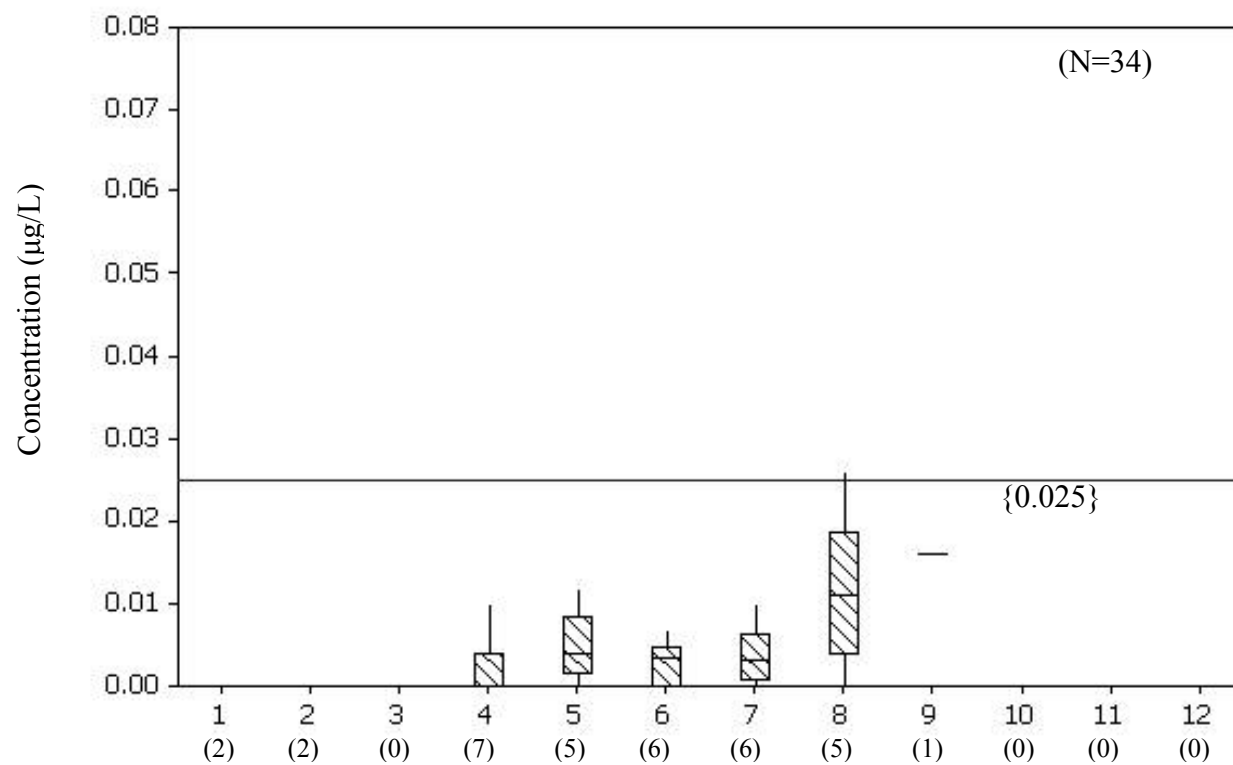
**Mud Slough at Highway 140 near Gustine monthly diazinon and chlorpyrifos concentration data, 1991 – 2001**

Concentration data for this monitoring site was obtained from the following sources:  
DPR Surface Water Database and USGS.

The diazinon data was collected in the period between 1991 and 1994 (11 data values), in 1999 (1 data value) and in 2001 (22 data values). The chlorpyrifos data was collected in the period between 1991 and 1994 (11 data values), in 1999 (1 data value) and in 2001 (22 data values).



Mud Slough at Highway 140 near Gustine monthly diazinon concentrations

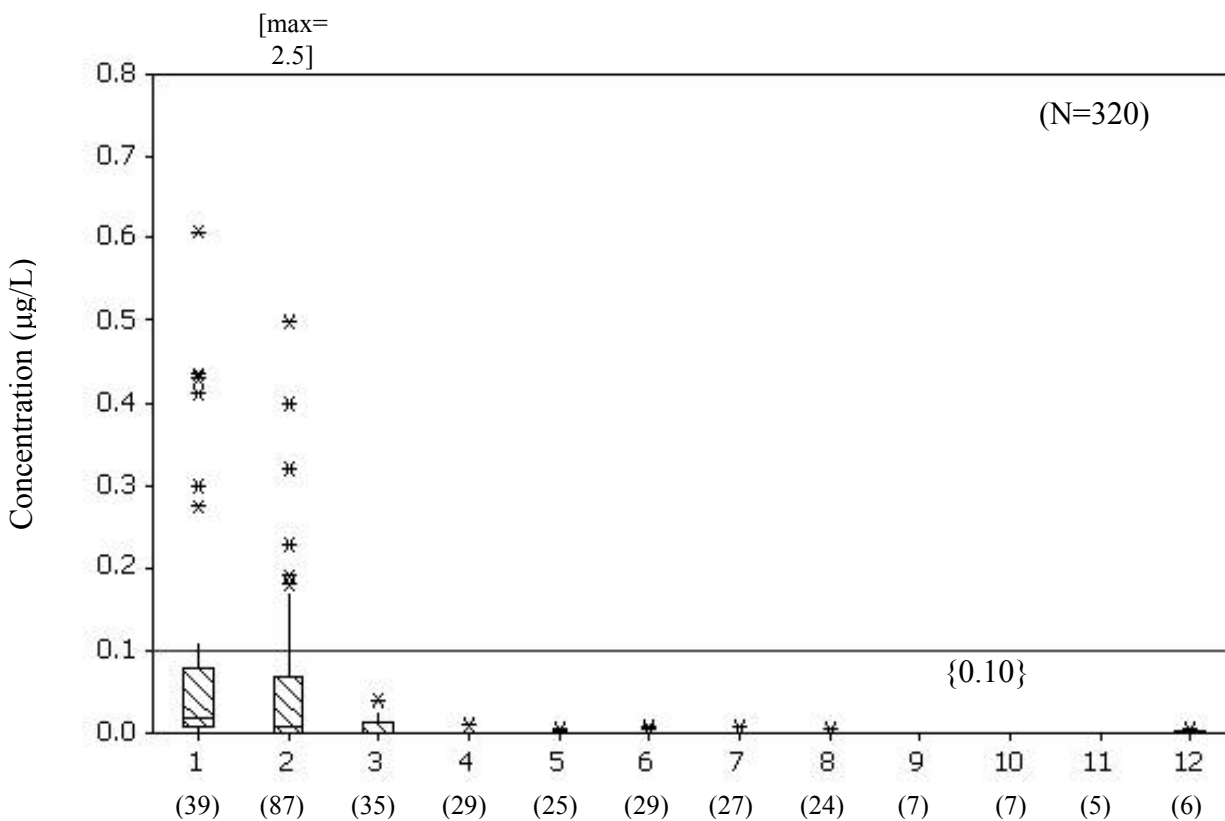


Mud Slough at Highway 140 near Gustine monthly chlorpyrifos concentrations

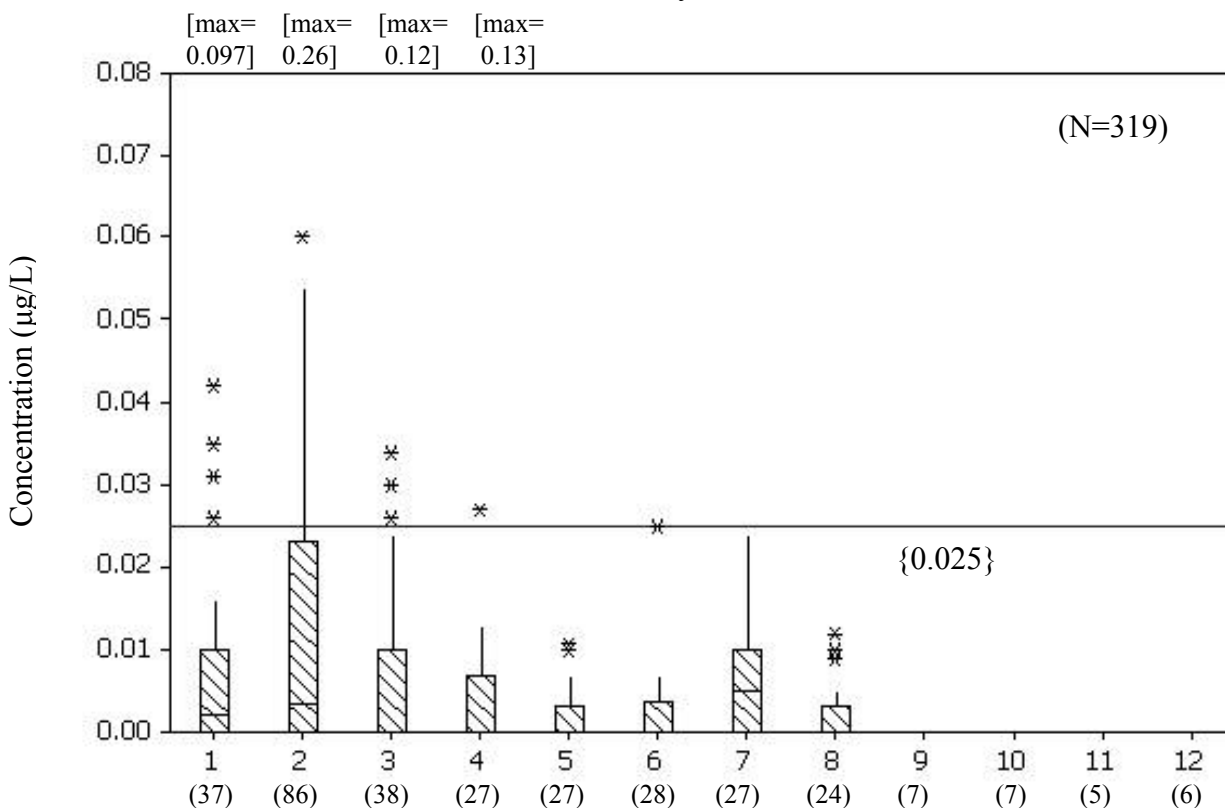
**Merced River at River Road monthly diazinon and chlorpyrifos concentration data, 1991 – 2004**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the periods between 1991 and 1995 (140 data values) and between 1997 and 2004 (180 data values). The chlorpyrifos data was collected in the periods between 1991 and 1995 (140 data values) and between 1997 and 2004 (179 data values).



Merced River at River Road monthly diazinon concentrations

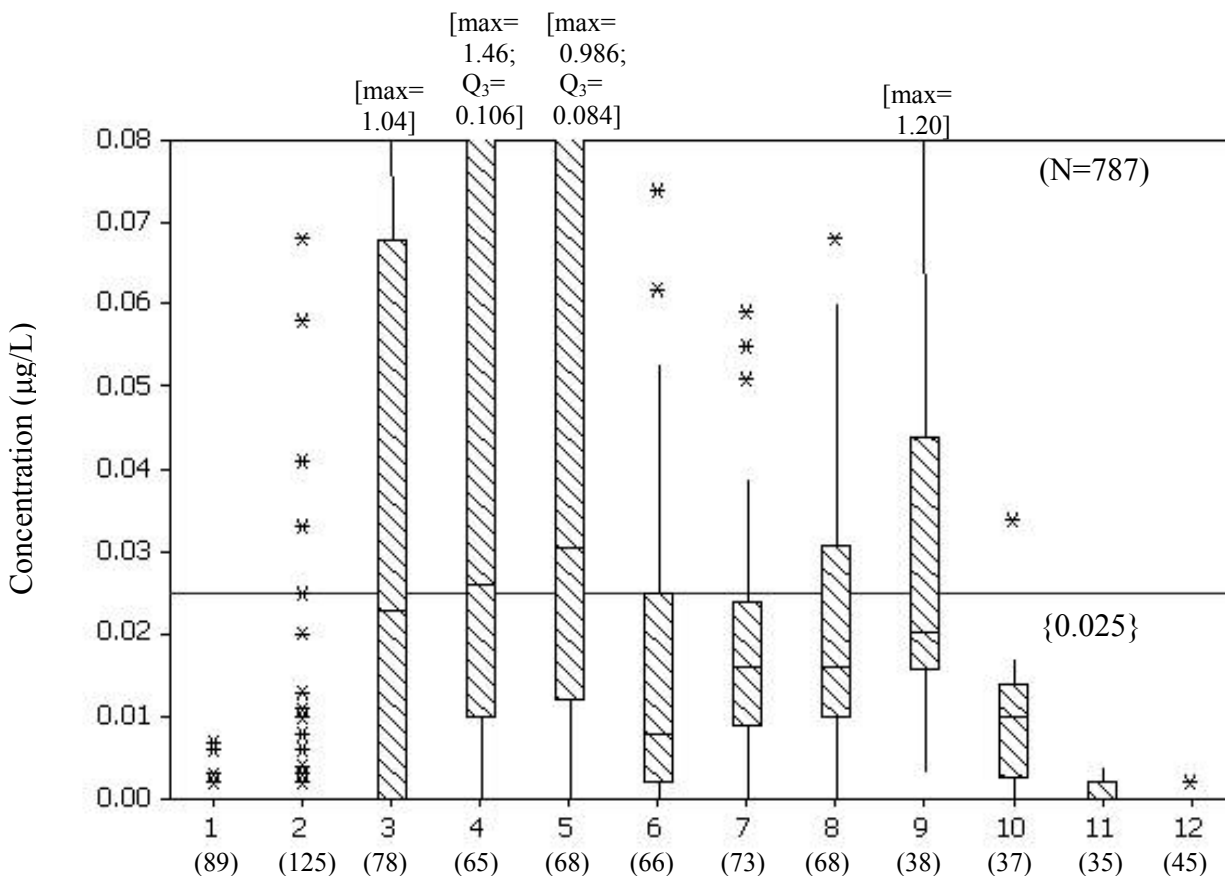
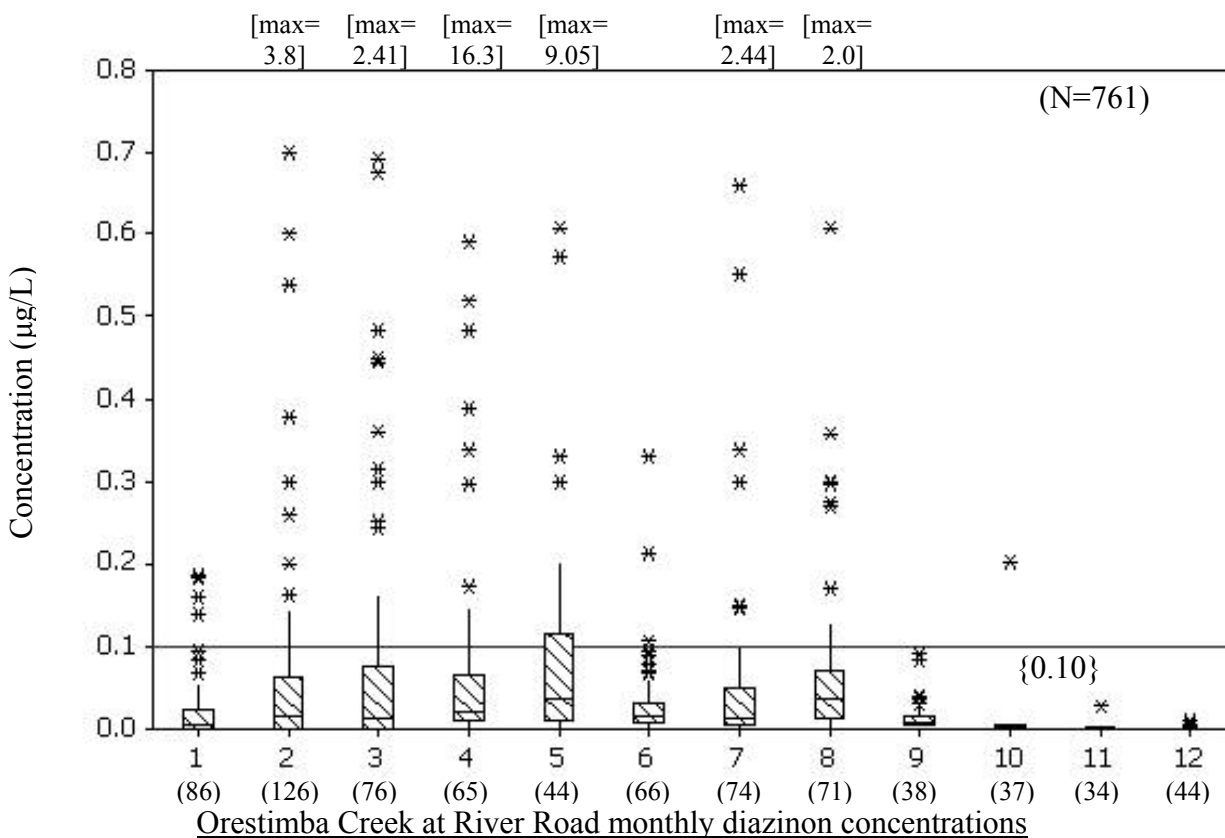


Merced River at River Road monthly chlorpyrifos concentrations

**Orestimba Creek at River Road monthly diazinon and chlorpyrifos concentration data, 1991 – 2003**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the period between 1991 and 2003 (757 data values). The chlorpyrifos data was collected in the period between 1991 and 2003 (774 data values).

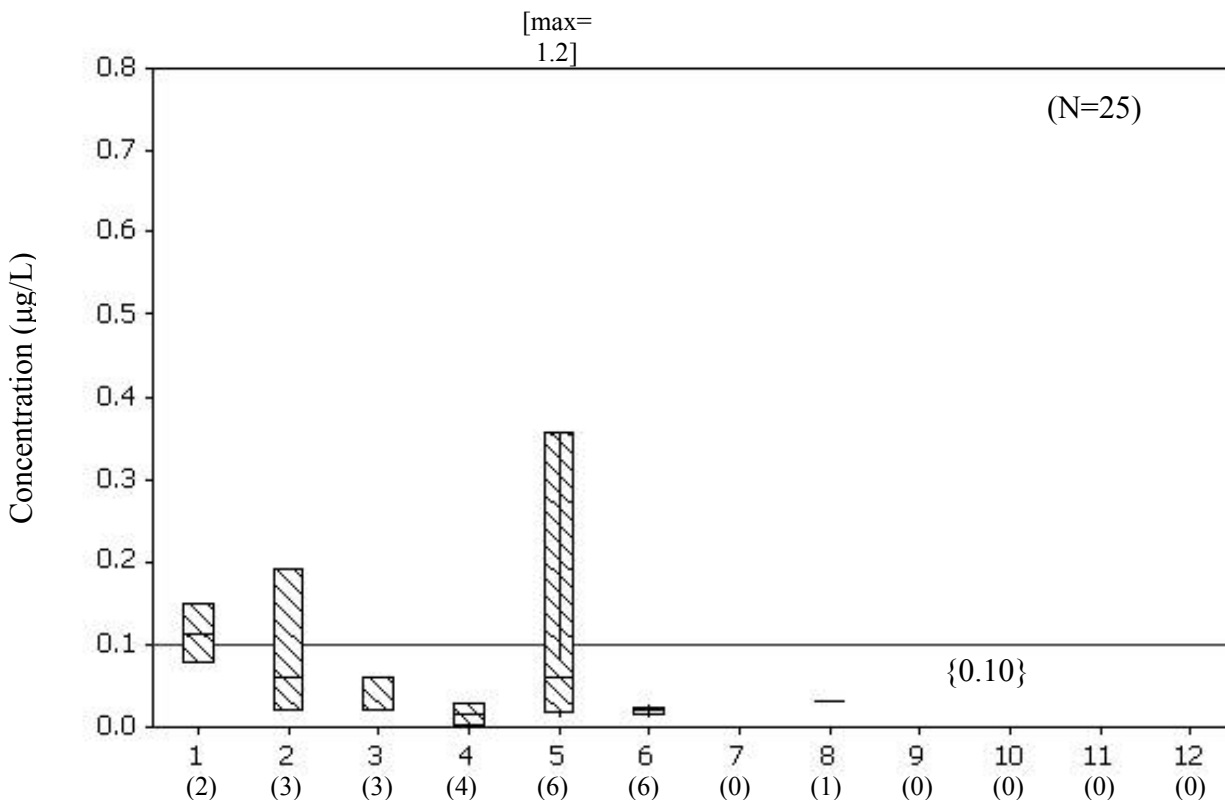


**Spanish Grant Drain near Patterson monthly diazinon and chlorpyrifos concentration data, 1991 – 2001**

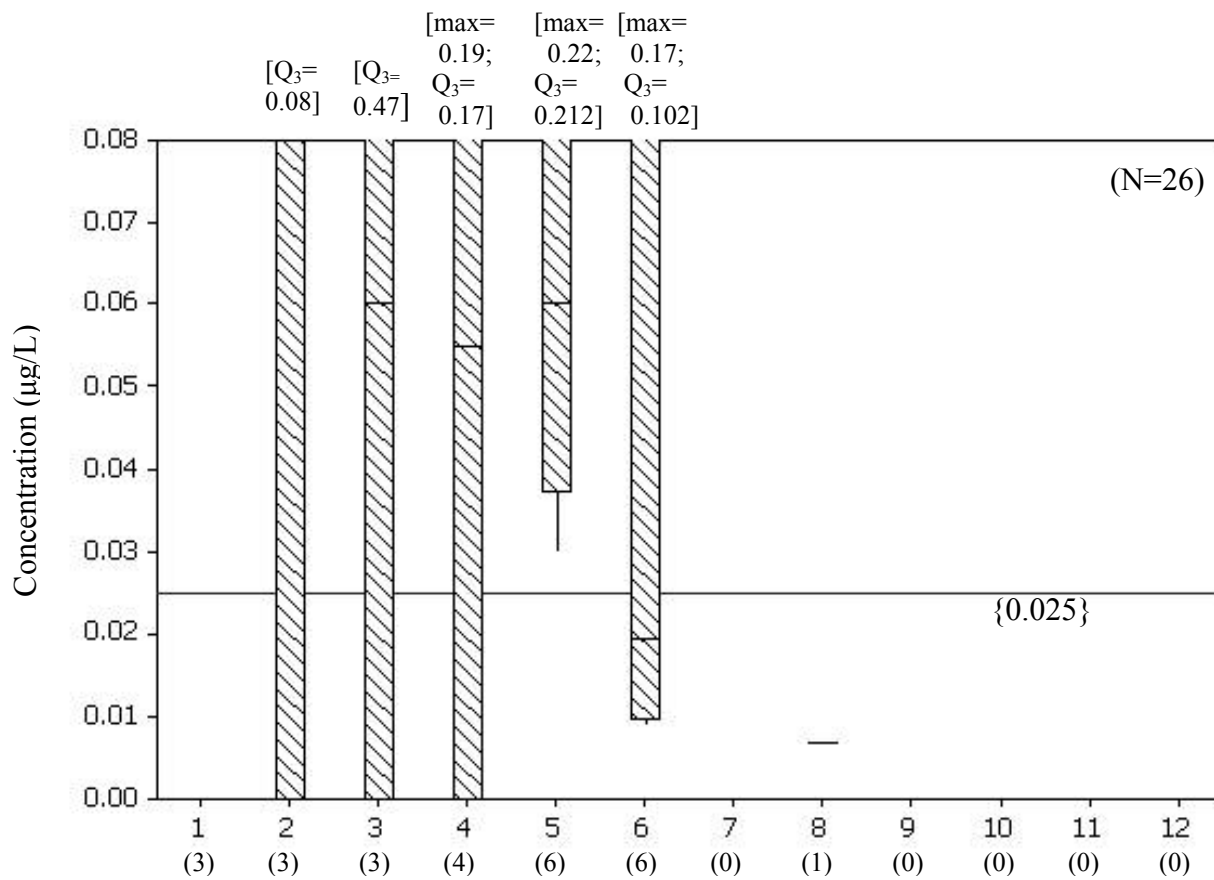
Concentration data for this monitoring site was obtained from the following sources:  
DPR Surface Water Database and USGS.

The diazinon data was collected in the period between 1991 and 1994 (23 data values) and in 2001 (2 data values). The chlorpyrifos data was collected in the period between 1991 and 1994 (24 data values) and in 2001 (2 data values).





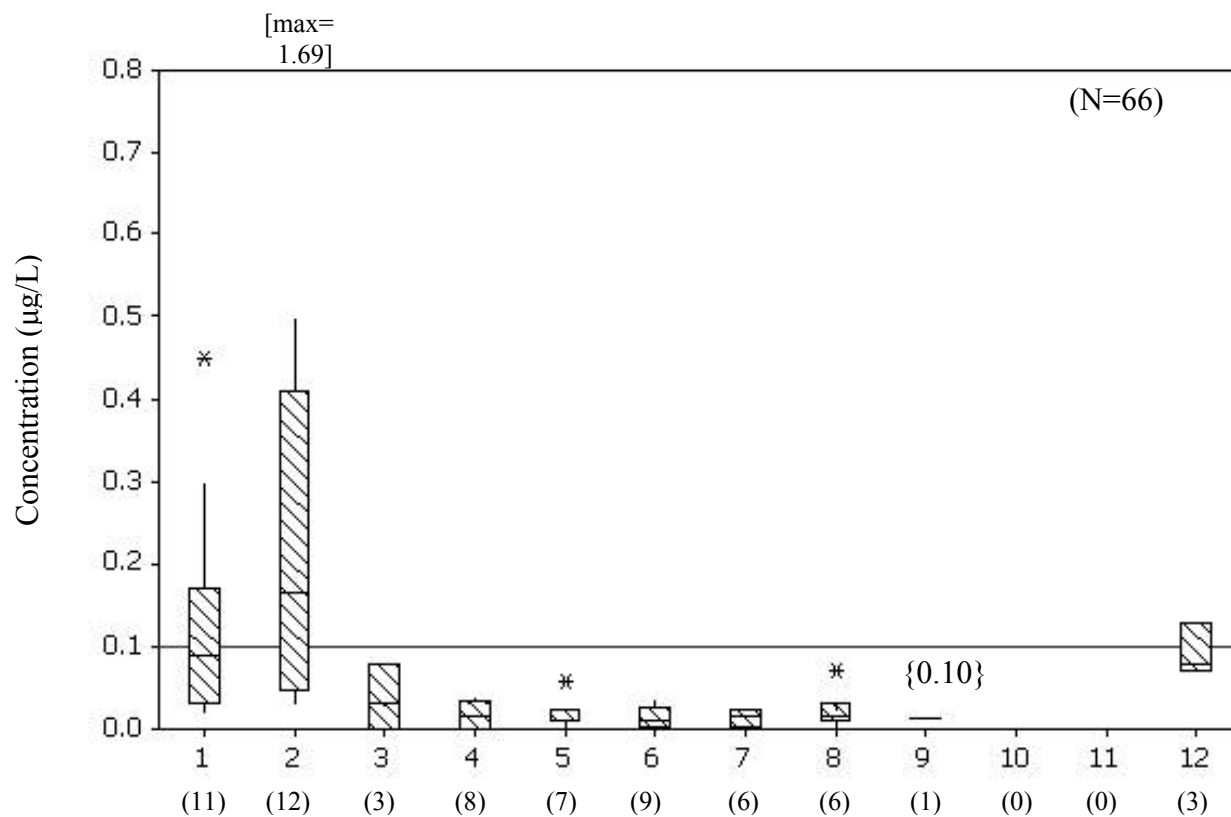
Spanish Grant Drain near Patterson monthly diazinon concentrations



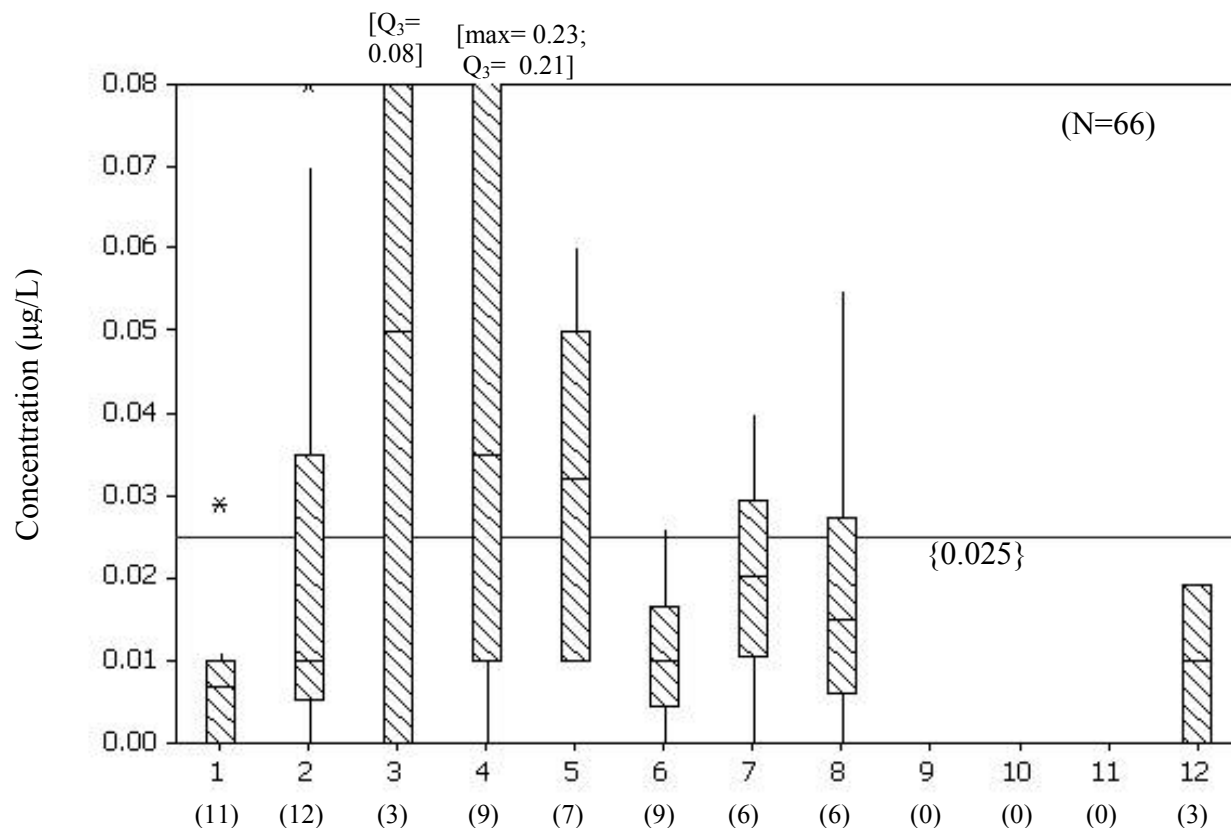
Spanish Grant Drain near Patterson monthly chlorpyrifos concentrations  
**TID Lateral 5 (Harding Drain) monthly diazinon and chlorpyrifos concentration data, 1991 – 2001**

Concentration data for this monitoring site was obtained from the following sources:  
DPR Surface Water Database and USGS.

The diazinon data was collected in the periods between 1991 and 1994 (52 data values) and between 1999 and 2001 (12 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (55 data values) and between 2000 and 2001 (11 data values).



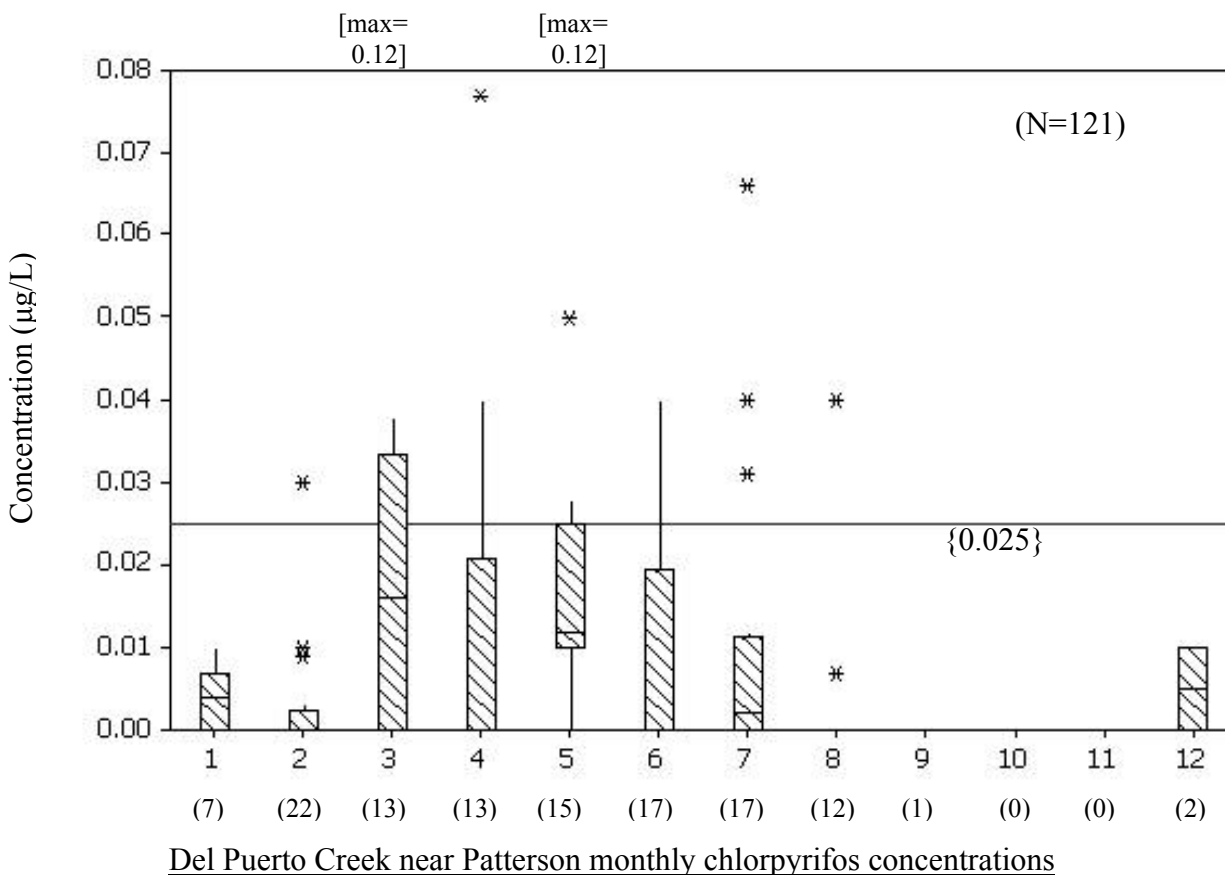
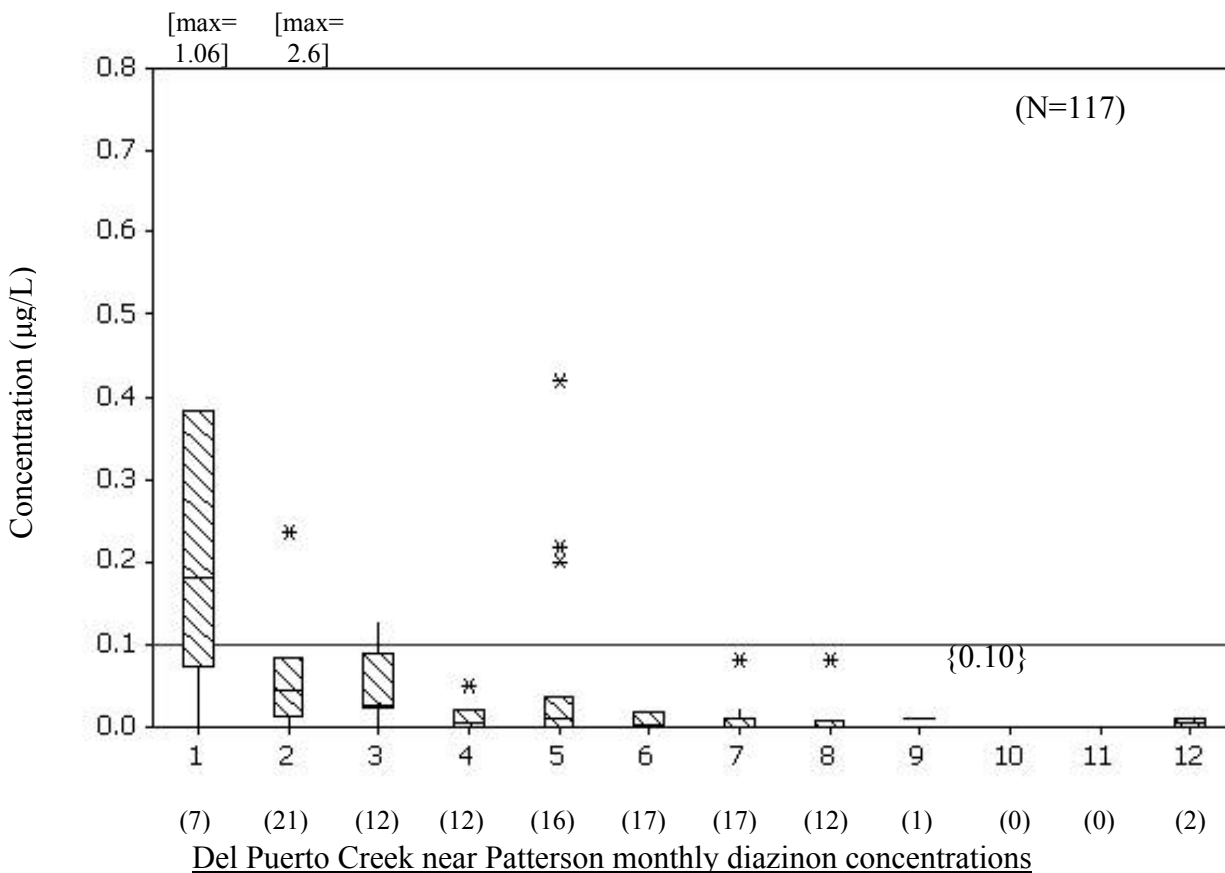
TID Lateral 5 (Harding Drain) monthly diazinon concentrations



TID Lateral 5 (Harding Drain) monthly chlorpyrifos concentrations  
**Del Puerto Creek near Patterson monthly diazinon and chlorpyrifos concentration data,  
1991 – 2003**

Concentration data for this monitoring site was obtained from the following sources:  
DPR Surface Water Database; USGS; and CVRWQCB.

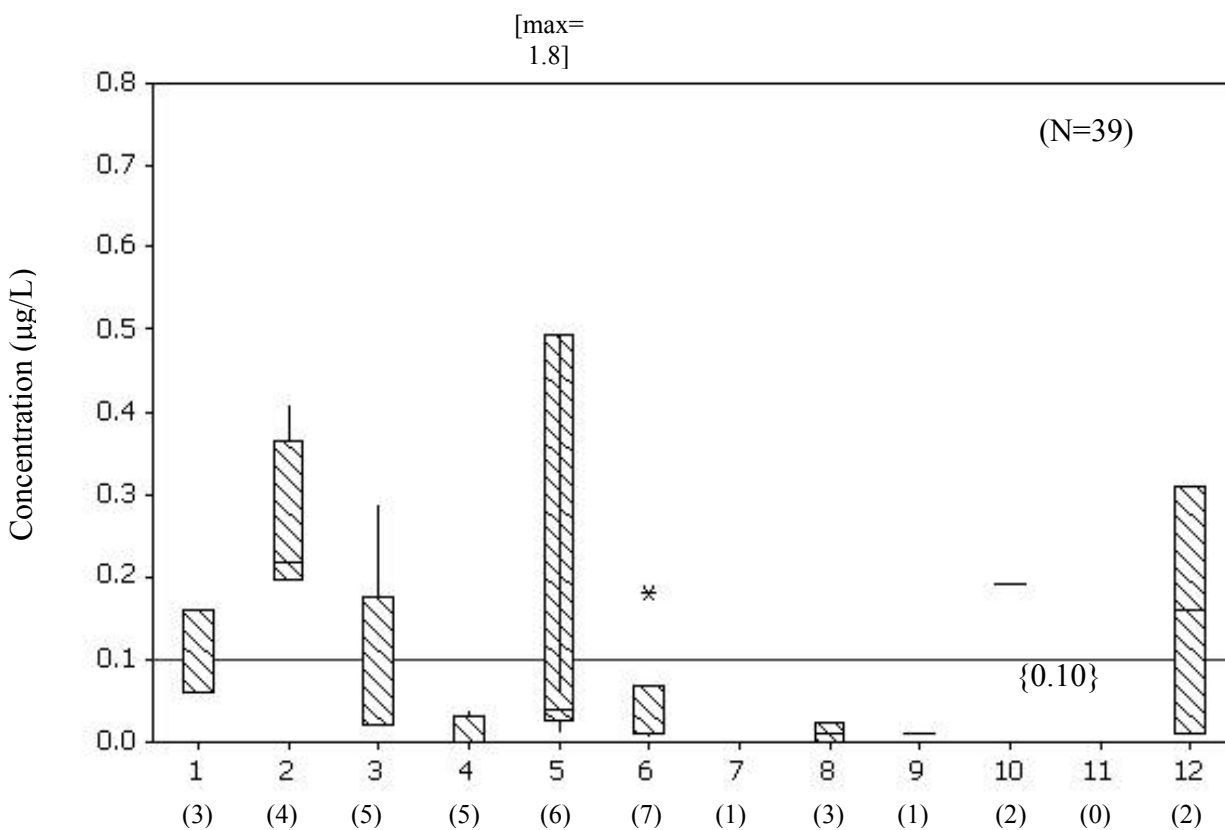
The diazinon data was collected in the periods between 1991 and 1994 (32 data values) and between 2000 and 2003 (85 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (34 data values) and between 2000 and 2003 (85 data values).



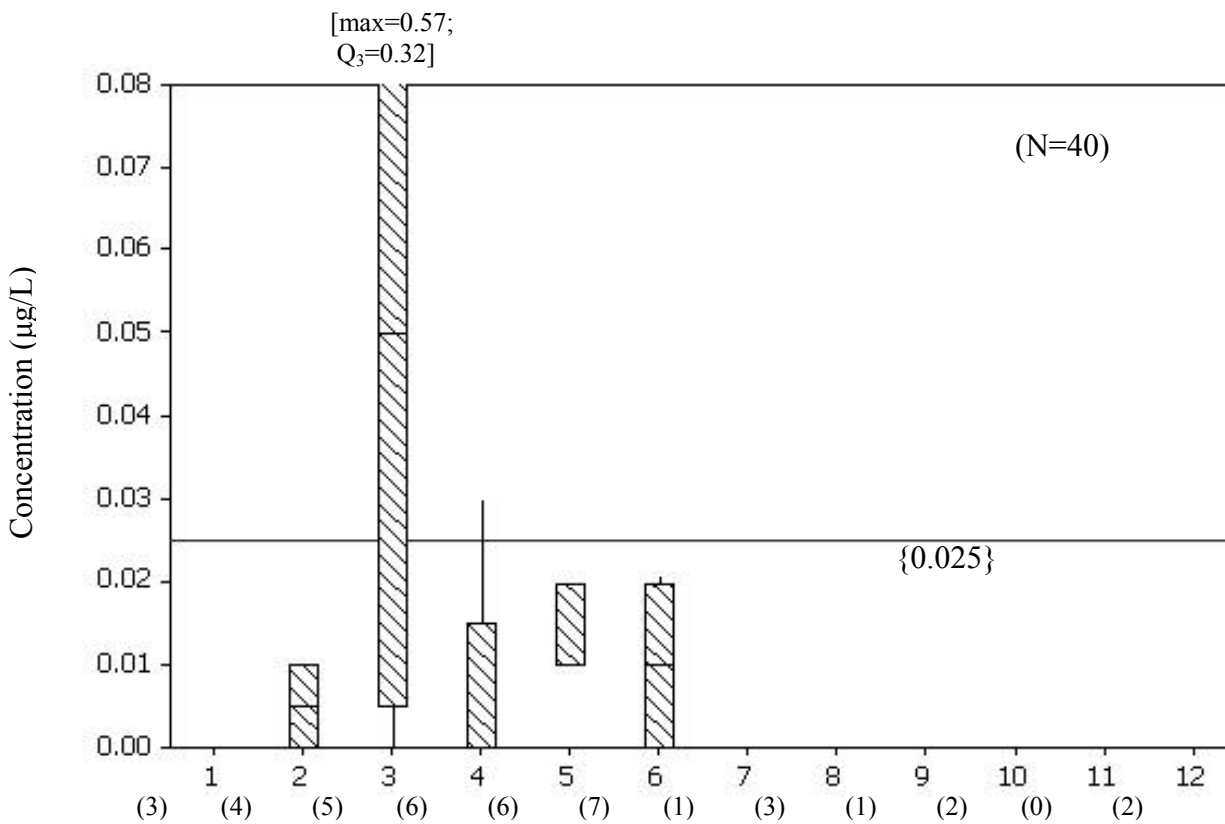
**Ingram and Hospital Creeks at River Road monthly diazinon and chlorpyrifos concentration data, 1991 – 2001**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database and USGS.

The diazinon data was collected in the period between 1991 and 1994 (34 data values) and in 2001 (4 data values). The chlorpyrifos data was collected in the period between 1991 and 1994 (36 data values) and in 2001 (4 data values).



Ingram and Hospital Creeks at River Road monthly diazinon concentrations



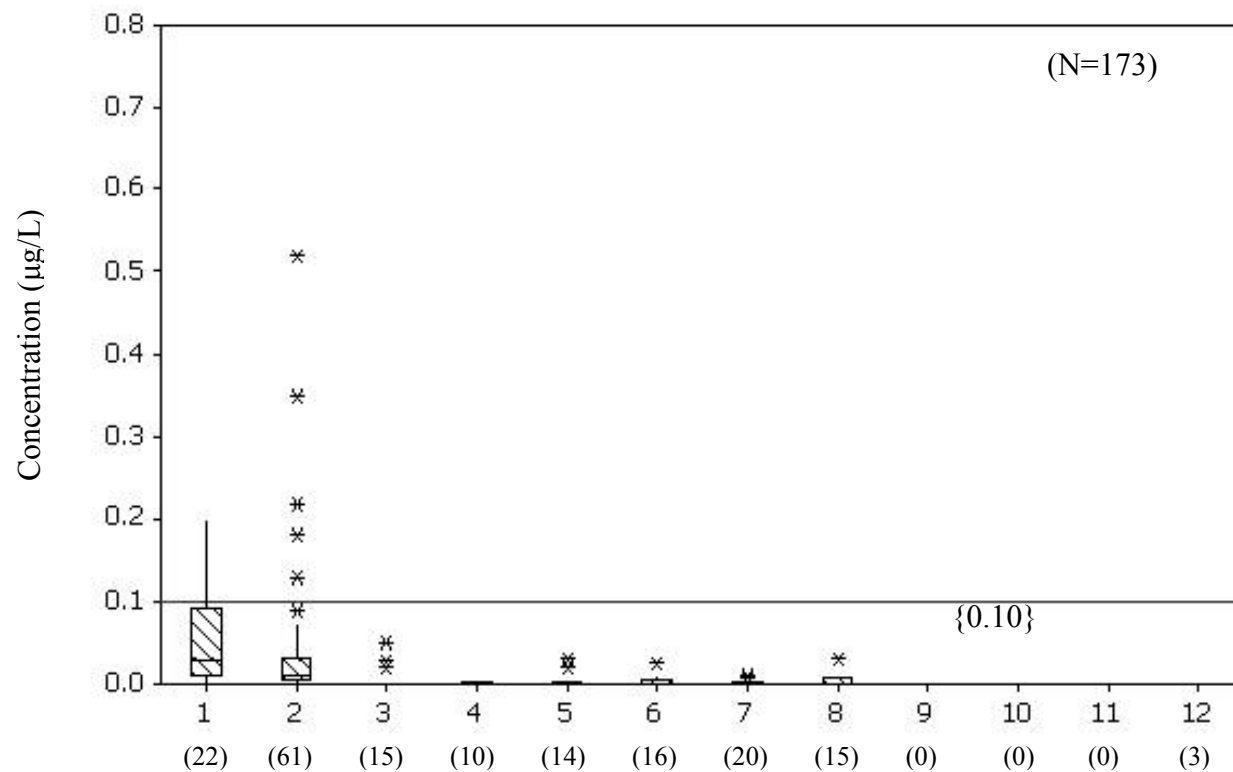
Ingram and Hospital Creeks at River Road monthly chlorpyrifos concentrations

**Tuolumne River at Shiloh Road monthly diazinon and chlorpyrifos concentration data, 1991 – 2004**

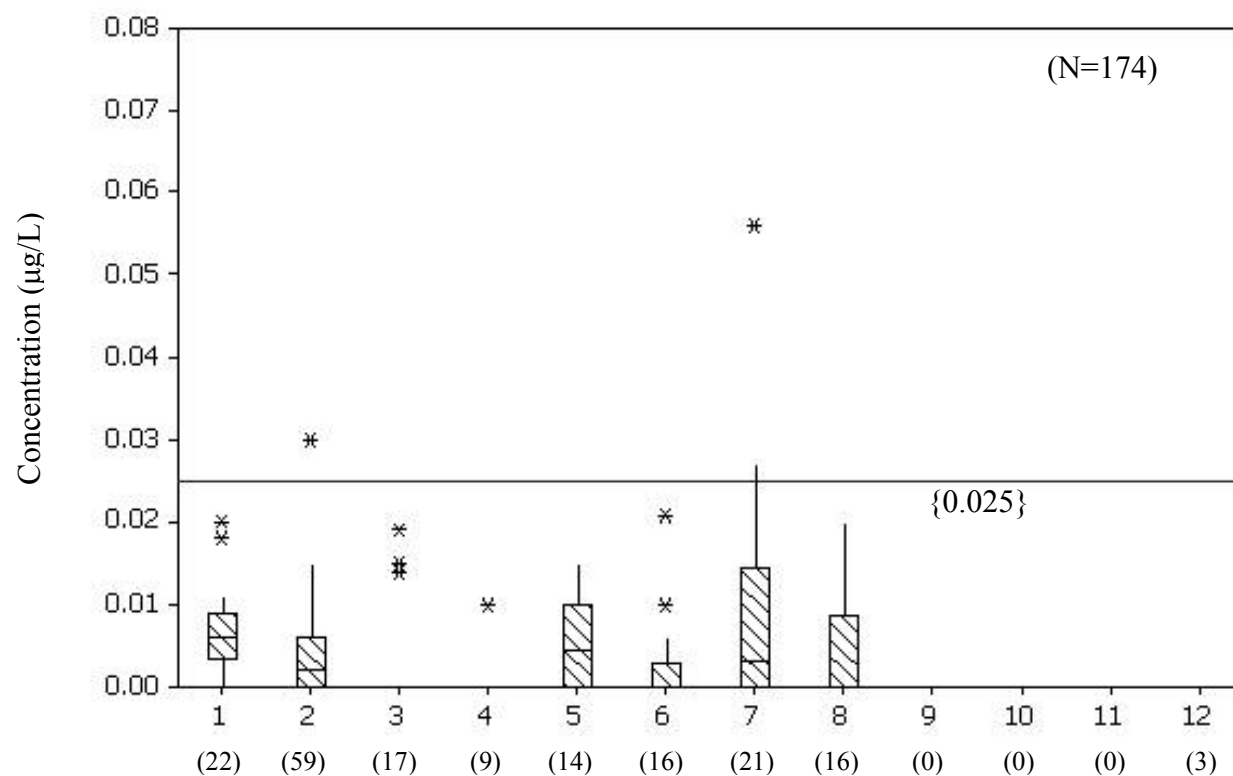
Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the periods between 1991 and 1994 (20 data values) and between 2000 and 2004 (153 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (20 data values) and between 2000 and 2004 (153 data values).





Tuolumne River at Shiloh Road monthly diazinon concentrations

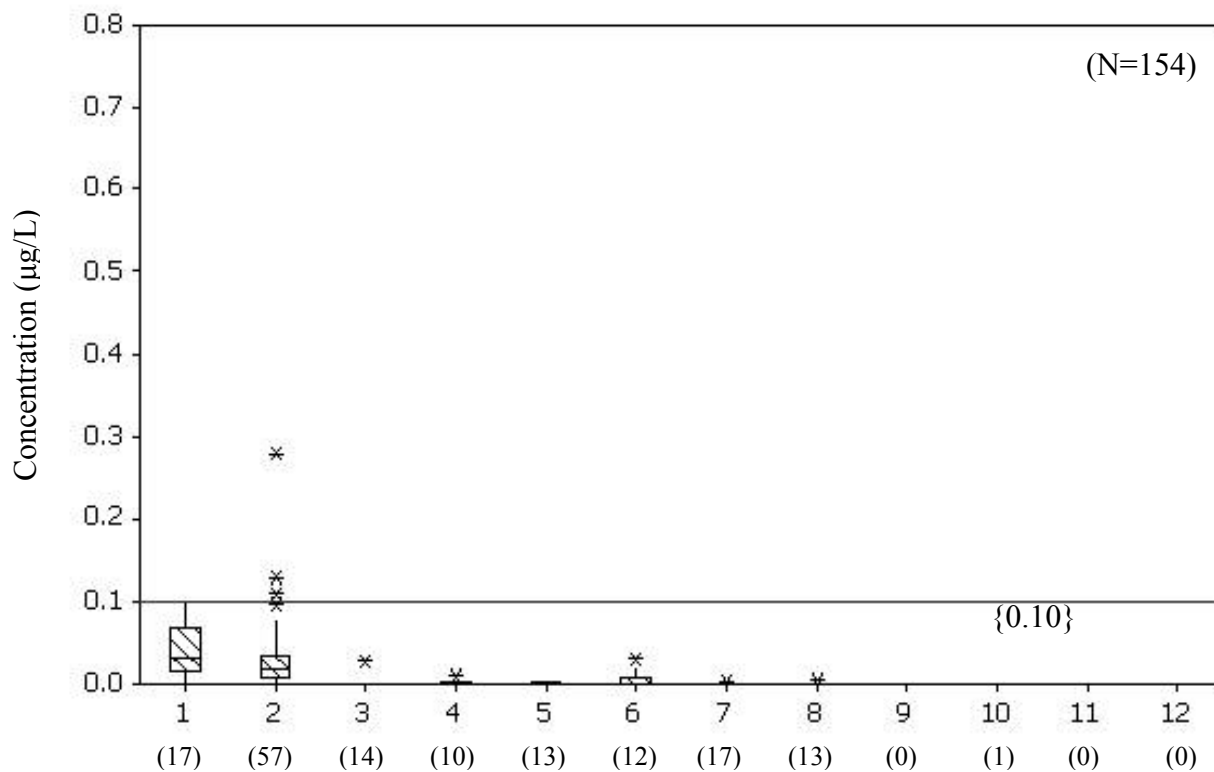


Tuolumne River at Shiloh Road monthly chlorpyrifos concentrations

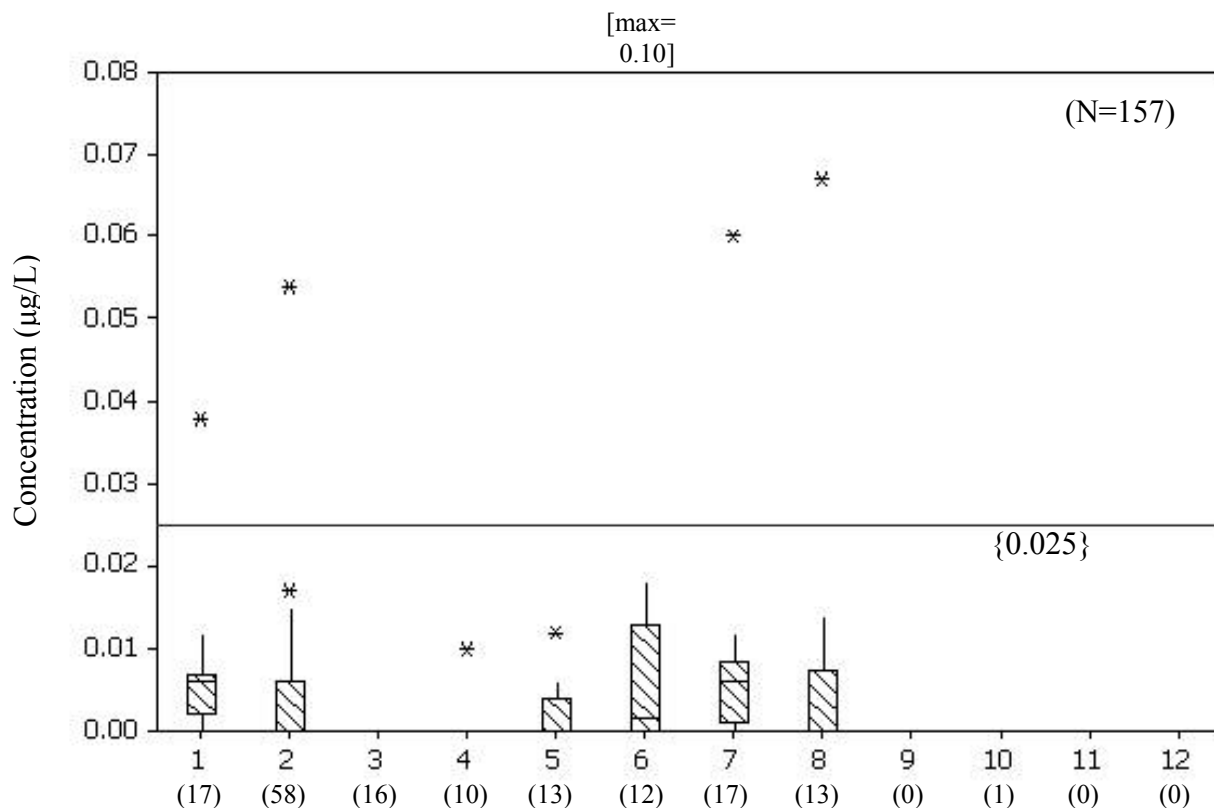
**Stanislaus River at Caswell State Park monthly diazinon and chlorpyrifos concentration data, 1991 – 2004**

Concentration data for this monitoring site was obtained from the following sources: DPR Surface Water Database; USGS; and CVRWQCB.

The diazinon data was collected in the periods between 1991 and 1994 (19 data values) and between 2000 and 2004 (132 data values). The chlorpyrifos data was collected in the periods between 1991 and 1994 (22 data values) and between 2000 and 2004 (135 data values).



Stanislaus River at Caswell State Park monthly diazinon concentrations



Stanislaus River at Caswell State Park monthly chlorpyrifos concentrations

# **Appendix C2**

## **Diazinon Concentration Data in the Lower San Joaquin River Basin, 1991-2001**